The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XLI. October 7, 1939 No. 1,058

Losses on the Home Front

THE winning of a war calls for two main efforts, the first on the field of battle and the second on the home front. Every scrap of power that may be useful on the first must of necessity be withdrawn from the second, and no considerations of hardship or self interest or even public convenience can be entertained against the need of furnishing the fighting forces with everything they may require. After that, all wisdom dictates that nothing should be done unnecessarily to weaken or destroy those home forces which exist in peace as well as war to provide the nation with the means to live. A war budget is an obvious necessity and the savage demands of Sir John Simon upon everybody's income and everybody's work, are accepted by all as a proper part of the business of carrying on a war. When, however, the Chancellor hopes to collect a 1s. National Defence Contribution, a 60 per cent. Excess Profits Tax, 7s. 6d. on the residue, and then a surtax up to 9s. 6d. on anything that percolates through to proprietors, those hopes are founded upon the assumption that the businesses of the nation will, as far as possible, be allowed to continue to function.

The first month of the war compares very favourably with 1914 in the matter of losses on the battle front. Those are the supreme losses and the consequent gratitude of the nation cannot be exaggerated. But in the minor matter of the home front, the economic losses have already exceeded those of the first two years of the 1914/18 war. Never was devastation wrought so rapidly. Before the war started Germany was crumbling from State activity, and some of our Civil Service Departments would appear to be determined to rob us as quickly as possible of that advantage over the enemy. All our ordinary economic strength has been attacked from two sides. On the one hand there has been an understandable but ill-considered rush for National Service. Local and national public offices have been bombarded by well-meaning people, who foolishly imagine that they can help by giving up their ordinary work of providing revenue for the public funds, and undertaking something different at the expense of the general purse. On the other hand, the departments have not been reluctant to profit from this wave of hurried patriotism.

In the result many useful plans and schemes have been transformed into grave public abuses. Examples are to be found on every hand. In order to evacuate a million children, transport facilities and roads which ordinarily handle twenty million passengers a day were almost closed for a week. To effect the purpose of rationing, the elaborate machinery of the Census is employed, and 65,000 enumerators are added to the hundreds of thousands of unnecessary public jobs, created since the war began. It is admittedly possible that enemy bombers may destroy a bridge. Waterloo Bridge has been out of action for years, causing grave inconvenience to the citizens of London, but the bridge over the stream at Puddlecombe may be bombed and that is more to the popular fancy. Accordingly, a "Meccano" sort of device is promptly adopted, dumps of material are distributed all over the country, local squads of amateur engineers are trained and paid, to be ready for an emergency which, if it happens, will be of no real importance. The new bridges are admittedly of no use to railways or any but the lightest traffic. The same sort of thing is happening in a hundred different ways, and this is supposed to be winning the war.

The Ministry of Information has taught us a lesson, if only we would learn it; 999 people to perform functions which some think wholly redundant, but which if wanted could be handled by half a dozen competent journalists. The public should understand that what has been done to the newspaper trade has also been done to other vital industries. It happens that the Press can secure the ear of Parliament and in that way the redundancies of "Information" have been brought to the public notice, but an exactly similar story could be told about most commodities and many trades.

The official mind is incapable of believing that the business man can be trusted to function even in minor ways and thus everywhere scores of amateurs are to be found, performing "National Service" at the public expense, doing in the most complicated and roundabout fashion the work of one tradesman. The tradesman has not only been forbidden to serve the public as he might, but has also been robbed of his chances to contribute to the Budget. The nation makes a double sacrifice, first in increased expenditure, and later in diminished revenue. This is not the way to win the war.

NO WASTE, NO DISAPPOINTMENT

BRITISH newspapers have had imposed upon them the national obligation to limit "returns" of unsold copies, with a view to their complete elimination within a few weeks time. Readers of THE CHEMICAL AGE are therefore strongly urged to become direct subscribers or to give a definite order to a newsagent or at a bookstall if they have not already taken either course. By doing so they will (a) help to conserve the supplies of paper in the country, (b) avoid unnecessary use of various means of transport, and (c) avoid the disappointment of missing their trade journal. In cases of difficulty readers should write to The Publisher, Bouverie House, Fleet Street, London, E.C.4.

NOTES AND COMMENTS

Vitamin C.

AS part of the research to establish the relationship of Vitamin C (cevitamic acid) to the common cold, a study of the influence of Vitamin C on the commonly used drugs has been undertaken by Dr. S. L. Ruskin and Dr. M. P. Fejos, of New York City. A report of their investigations was given in the form of a paper read at the meeting of the American Chemical Society recently. They stated that the traditional usefulness of orange and lemon juice suggested a possible chemical relationship of Vitamin C to such drugs as adrenalin, ephedrine, and benzedrine. It was found that stable compounds of enhanced physiological action were obtained when these substances were chemically reacted with Vitamin C. An outstanding observation was the mutually stabilising action of these compounds on Vitamin C. Although both the Vitamin and adrenalin are relatively unstable in solution the chemically reacted adrenalin cevitamate is quite stable. Similarly ephedrine and benzedrine stabilise Vitamin C and permit the preparation of solutions that will retain full potency over two years. The authors contend that the widespread use of ephedrine in the treatment of common colds makes the preparation of ephedrine cevitamate a definite advance in the chemistry of the treatment of the common cold.

River Pollution from New Works

IN a letter to *The Times* last Monday, Mr. C. A. M. Skues, secretary of the Pure Rivers Society, makes a special appeal to those who may have the responsibility of setting up new works or adapting existing factories to war-time production, to give careful consideration to the question of the disposal of their effluents or waste products before making any final decision as to the siting of buildings and plant. Many of the worst pollutions have been due to lack of such consideration, resulting in works being planted in positions where the levels or lack of space have made the provision of any adequate measures for rendering effluents innocuous extremely difficult and expensive. He goes on to point out that it is often more economical to place works away from a river bank than on it. Foundations are generally much less costly, levels are better, and, above all, it is generally easier to provide the essential space for dealing with waste products, whether fluid or solid, without causing pollution. Where no alternative site offers, there are, of course, many efficient methods of dealing chemically with effluent, well known to readers of THE CHEMICAL AGE, who may none the less be grateful for a reminder.

Nylon

FOUR patents for hosiery and other knitted fabrics made of Nylon, the new organic textile fibre derived basically from coal, water and air, were issued to E.I. Du Pont de Nemours and Company by the U.S. Patent Office recently. With the issue of the patents, officials of the Company claim that the inventions represent "a phenomenal advance in the textile arts," assuring "a truly successful stocking from a synthetic yarn." The patents set forth that Nylon has great elasticity, strength and wearing qualities; that it presents an excellent appearance; that it is virtually wrinkle free; that it dries extremely rapidly after laundering; and that stockings made of it may be washed repeatedly without material change in their original shape and smooth characteristics. The patents cover the use of polyamide yarn for stockings, pre-boarding of stockings, setting yarns and fabrics, and the use of sodium sulphite for setting. The Company's chemists say Nylon is the first man-made organic textile fibre prepared wholly from raw materials from the mineral kingdom. Nylon differs from rayon in that it contains no cellulose. The word "Nylon" was coined by the Company as the generic name for all materials defined scientifically as "synthetic fibre-forming polymeric amides having a protein chemical structure; derivable from coal, air, and water, or other substances, and characterised by extreme toughness and strength and the peculiar property to be formed into fibres and into various shapes, such as bristles and sheets."

Acrylic Resins for Denture Bases

TESTS by the U.S. National Bureau of Standards on the curing, "shelf life," colour stability, strength, hardness and dimensional changes on curing, were made on three acrylic resins (Crystolex, Lucitone, and Vernonite) furnished to the dental profession for use as denture base materials. In comparison with hard rubber they have satisfactory mechanical properties and are superior in colour stability. The shelf life of the two resins furnished in a plastic cake was short at room temperature, while the resin (Crystolex) furnished in powder and liquid was satisfactory in this respect. Observations on dentures in service showed that phenol-formaldehyde resins (Aldenol, Duratone, Luxene) warped and were not colour-stable, while an acrylic resin (Vernonite) was colour-stable and showed less warpage. When all factors are considered, such acrylic resins as were tested appear to be the most satisfactory plastics currently used for denture bases.

Profiteering

FROM information received last week it appears that suburban grocers are not the only traders who have taken advantage of the present price situation to indulge in profiteering. A firm of agents, seeking a supply of an urgently needed chemical, were informed by the supplier that two grades were available at 80s. and 60s. per cwt.—about three times the normal price. Urgency demanded that the prices asked should be paid, and a supply at 60s. was bought—to be passed on to the consumer at a further small profit. Later inquiries from another firm of suppliers revealed the fact that ample quantities of the same grades were available on the same terms of supply at from 26s. to 35s. per cwt. A little uncertainty is naturally inevitable in these days of transition; but the huge disparity in price here recorded would seem to demand instant investigation and revision on the part of the trading associations concerned.

Against the National Interest

THE above paragraph lends additional point to a letter addressed to the Prime Minister by Mr. Peter Bennett, president of the Federation of British Industries, recalling that when the rearmament programme was started in 1936 the Federation promised its support in ensuring that the needs of the country should be met efficiently and economically. "Now that we are at war," the letter continues, "I desire, as president of the Federation of British Industries, to state that it is more than ever realised by industry that unreasonable increases of prices are against the national interest. Apart from that overriding consideration, it is against the interests of industry itself that such increases should take place, since industry is not only a producer but also an immense consumer of

industrial products and raw materials in one form or another. Moreover, industry realises that if price increases should occur, beyond such as may be necessary owing to increased costs of production due to causes outside its control, the nation would rightly demand that the Government should intervene, otherwise inflation, with all its attendant evil, would inevitably follow sooner or later.

Export Licences

THERE is no question of the great importance which the Government attaches to the maintenance of the export trade in time of war. Manufacturers declare from personal experience that instructions seem to have been given to the war departments that they should interfere as little as possible with productive capacity vital to export work. So far so good. But manufacturers are faced with one great difficulty, it is to know just where they stand in the matter of licences for obtaining materials, and how long it will be before they can expect to obtain delivery. In many branches of British industry it is very important for the manufacturer to know where he stands when he is quoting, for he cannot expect customers to place orders with him if he is only able to give them a very indefinite promise of delivery. Ability to quote firm prices is also an important question, but in some cases customers may be prepared either to gamble a little on increases in the cost of manufacture or to pay a fairly high firm price which will cover the manufacturer against possible increases in price before the order is executed. What customers are not in a position to gamble with is the date of delivery, especially in cases in which the functioning of a business depends upon the delivery of a particular article or piece of machinery.

A Simple Solution

IT is understood that the Minister of Supply is at the present moment reflecting on the best way of solving this problem. The best advice the trade press can give the authorities is that the export trade should be free from every unnecessary restriction. Manufacturers for export fully appreciate that the war departments must have first call on all the material they need for the conduct of the war. They likewise understand that even if there are ample supplies it is necessary to maintain some sort of control over them so that they are not frittered away. If, on the other hand, the exporter is to play his part to the best advantage in the national economy, it is of the first importance that controls, licences, etc., should be reduced to the absolute minimum and that the machinery for putting them into operation should be elastic and rapid in action. Government departments have recent peace-time experience of monthly quotas or licences issued for a limited period. War time calls for a different approach, and if the export trade is to move smoothly those departments will have to adopt other methods. It is not at all uncommon for an order to take two or three months to be negotiated and then four or five months to be executed. In such a case the granting of a licence for a period of two or three months would be quite useless, for it would merely tie the hands of the manufacturer during negotiation of the order. The simplest solution of the problem would be for the export business to be freed from hampering restrictions as far as possible by the issue of general licences to accredited manufacturers for selected countries.

Chemical Matters in Parliament

Science Students

IN the House of Commons, Rear-Admiral Beamish asked the Secretary of State for War whether his attention had been drawn to a letter issued to Cambridge undergraduates in which it is stated that medical students, research or post-graduate students in engineering, metallurgy, chemistry, physics, mathematics and biology will not be used for normal combatant service; and whether this was issued with the approval of his Department.

Sir V. Warrender replied that he had not seen the letter referred to, but it had been agreed that medical and dental students who had attained a certain stage in their medical and dental studies should complete those studies with a view to medical or dental employment with the Forces or as civilians. Arrangements had also been made to secure that the services of the research and post-graduate students mentioned in the question should normally be used, either in the Forces or in civil life, in such a way as to make the best use of their scientific or professional abilities.

Mr. Ede: Does that apply to other universities than Cambridge?

Sir V. Warrender: Yes, Sir.

Mr. Ede: Does it apply to all universities?

Sir V. Warrender: It applies to all students studying those scientific subjects.

Producer Gas

IN the House of Lords last week the Duke of Montrose called attention to the fact that while there were restrictions on petrol for transport purposes the Government did not appear to be taking adequate steps to develop alternative fuels or means of propulsion. He said that without petrol the Royal Air Force, the mechanised Army and to some degree the Royal Navy would be worth little more than steel junk. The more we used alternative fuels which were indigenous to the country the more petrol would be available for the fighting forces. Until we got undisputed mastery of the air and sea further restrictions on petrol must be expected, but we seemed to be doing very little either through the Government or private enterprise to meet new restrictions.

The producer-gas system had passed the experimental stage and was now efficient. Germany had 10,000 motor-gas vehicles on the road, France 7,000 and Italy 3,000. Two hundred such vehicles were running on the roads of Great Britain. "I could take orders for gas-producers to-morrow for some of the largest manufacturers in the country working for the Government and for the railways," he continued, "but it is not war or munition work and I cannot get material. Since the petrol restrictions were announced my office has been simply besieged by people wanting to know about gas-producers."

Lord Teynham, president of the Transport Producer-Gas Association, said that the Government had arranged to pool their knowledge and resources with industry and the Coal Utilisation Research Association, and he understood research was being directed to the production of a gas-producer which could be fitted to lorries and heavy vehicles and an engine not adapted for petrol to use producer-gas.

Earl Fortescue (Lord-in-Waiting) replied that the use of compressed gas was a practical and efficient means of operating transport vehicles, but its development was difficult because of the capital equipment required. The Government had been endeavouring for some time, he added, to find a solution to the problems, and those engaged on the work hoped that it would be sufficiently far advanced to enable the Government to make a statement in a very short time.

It need not be feared that the Government were not fully alive to the necessity for adopting other devices in war-time to reduce the demand for imported articles, and circumstances might well dictate that in war methods should be adopted which in peace-time might not be economical. It was from that angle that the use of coal to replace petroleum was being attacked, and it would be prosecuted with vigour.

SYNTHETIC INSULATION MATERIALS

Resins for Coating Low-Voltage Wire

THE insulation of wire is an important part of the electrical manufacturing industry, since electric power is transmitted for long distances and is distributed in cities over wires, and electric and other forms of energy are interchanged with the aid of coils of wire. Designers of electrical equipment have shown great skill in making the best use, consistent with safety, of the insulating materials available to them, but the extent of their progress in invention and improvement rests jointly upon the ability of the chemist to provide, and the insulation engineer to apply, better and cheaper insulating materials.

In the field of 110-220 volt distribution wiring synthetic materials have begun to invade the domain of rubber compound and saturated textile braid insulation. In this field the mechanical and chemical requirements may be met by a number of synthetic plastics that are suitable from the dielectric standpoint. At present much wire is being insulated with plasticised polyvinyl chloride, under the trade name of "Flamenol," which is not only oil and water resistant, but also will not support combustion. The insulation is rapidly extruded upon the wire, requires no vulcanisation, and may be produced in a variety of colours so essential to complex industrial wiring. Development in this field of low-voltage insulation is proceeding rapidly, and the enormous market in building wire should provide an incentive for large-scale low-cost manufacture of materials.

In undertaking the development of a manufacturing process for magnet wire, i.e., insulated wire generally used in the form of coils for the purpose of interchange of electric and magnetic energy, there was a choice of methods of manufacture between wrapping a thin film of the resin on wire, extruding the resin directly upon the wire as is done with rubber and other plastic bodies, and coating the wire with a solution of the resin and baking the film.

In the long run the solution process has been selected as the most practical method of coating the wire with the polyvinyl formal resin, and in the course of the work a further advantage of this process was unexpectedly found when it was discovered that baked films of the resin were markedly superior to unbaked films, probably owing to a partial conversion to an insoluble infusible state.

Solutions of polyvinyl formal resin are very viscous; hence the conventional method of enamelling, in which the coated wire is drawn out of the enamel and directly into the oven, requires that the resin content of the solution be reduced to a few per cent. of the total. Wire can be insulated and has been insulated with polyvinyl acetal type resins by the conventional method of enamelling, but because of the large number of dips and bakes required and the loss of comparatively expensive solvents, improvements in the method were desirable. The problem was finally solved by the discovery of an entirely new principle of enamelling wire—the floating die principle, in which a floating die is maintained concentric with the wire by the wire itself and applies an accurately measured, concentric, uniform coating of solution around the wire. Now wire insulated with a film of synthetic resin embodying polyvinyl formal, known by the trade mark of "Formex," is in large factory production and use.

South African Chemical Notes

(From a Special Correspondent)

TESTS conducted in the laboratories of the University of Cape Town, where a sub-department of the department of chemistry is devoting itself to providing fundamental data on the biochemistry of fruit, as well as by the South African Deciduous Fruit Exchange have shown that break-down in Kelsey plums can be reduced to almost negligible proportions by the "dual temperature" method of storage.

This was revealed by Dr. Donen when he read two papers before the Royal Society of South Africa on "The role of sorbitol in the C-metabolism of the Kelsey plum." It had been discovered that the Kelsey plum contained a considerable amount of sorbitol, in some samples as much as 4.5 per cent. Sorbitol was a sugar alcohol, in composition very similar to glucose. Investigation had showed that it played an important part in the metabolism of the Kelsey plum. In plums kept at ordinary temperatures it was respired in preference to sugars. In plums that had been cold-stored part of it was stored for respiration and part of it gave rise to sugars, so that after about 21 days in cold storage the Kelsey plum contained 10 to 15 per cent. more sugar than when picked. The sorbitol content of the Kelsey plum was of considerable importance from the commercial point of view, for it had been established that there was a strict relationship between the sorbitol content of a plum and its susceptibility to injury in cold storage. The more sorbitol a plum contained the better its keeping quality. It had been calculated from tests that if the plum on picking contained less than 2.5 per cent. of sorbitol, the chances were 95 in 100 that the fruit would show between 10 and 20 per cent. of breakdown if kept at 31 to 32 degrees F. for 21 days before being ripened at a higher temperature.

Under the synthetic process introduced into South Africa a few years ago large quantities of ammonia for industrial uses are being produced at a chemical factory in Modderfontein. It used to be necessary to use annually some 18,000 tons of Chilean nitrates and 7,000 tons of sulphur for producing explosives for sale to the mines. For the manufacture of fertilisers and a few other products a quantity of Chilean nitrates are still being imported, but this trade does not compare in volume and value with that of 15 years ago. A considerable proportion of the by-products of the liquid ammonia and the gaseous ammonia production in the Transvaal are sent to the Somerset West factory, where they are converted into fertilisers and a wide range of chemical manufactures.

Interest is still being sustained in the proposal to develop a eucalyptus oil industry in South Africa, but progress here will depend upon the ability of the promoters to convert the crude oil into such valuable products as menthol, or thymol from piperitone, a-ionome from cirtal and other chemicals. It has been pointed out that crude oil can be made inexpensively when the ordinary steam distillation process is followed and where the firing is done with waste forest material. The use of cheap labour for collecting the leaves, the employment of portable stills and other such obvious economies would help further to reduce the production costs. But until some active step is taken, it is impossible to determine the possibilities for development in the projected industry.

THE output of cellulose in Germany (according to the *Berliner Boersen Zeitung*) increased from 27,000 tons in 1932 to 155,000 tons during 1938.

LETTER TO THE EDITOR

Welding Methods

SIR,—It is surprising to find in the Editorial pages of THE CHEMICAL AGE statements such as those contained in the article "Welding Methods in Chemical Plant." The views expressed appear to be based on a longer and more detailed review recently published in the engineering press, in which a number of reservations were made in regard to the value of welding. In the original article, which was a survey of the uses of welding for chemical plant, these reservations reflect a cautious attitude on the part of the author; taken from their context they appear as a condemnation of the welding process in general as well as for the particular application discussed. Furthermore, certain obvious misstatements were included in regard to the oxy-acetylene welding process. It would appear that the author had in mind the controversy which existed years ago concerning the relative utility of electric arc and oxy-acetylene welding. In those days, when advocates of each process rivalled each other in suggesting disadvantages to the detriment of the opposing camp, a number of statements were put forward which were very soon revealed as baseless by scientific investigation. Welding engineers are now more impartial, but it would be surprising if some memories of the earlier conflict did not remain. It is the object of the following reply to deal with the objectionable points in order as they were raised. There is a volume of test results and data which could be brought forward in support of these objections; these can be produced if the author will disclose the authority on which his statements are based; for reasons of space, the present reply must be confined to statements of fact.

An Adult Industry

After dealing with a number of advantages of the welding process, the first paragraph refers to weld-decay, uncertainties affecting welding construction and the personal equation. It goes on to state that welding is a scientific art that is yet in its infancy, and depends upon advances in metallurgy for its own advances. The last is, at least, literally true. Skilled chemists and metallurgists have devoted their attention to the welding process ever since its infancy, *nearly half a century ago*, and it is their researches which have overcome weld-decay, uncertainties (sic) and many problems, until the infant art is now a fully matured, adult industrial process. The personal equation has been dealt with by education of the welder, strict control of the process, and more and more foolproof welding equipment and materials. It is sound results obtained over a number of years, and increased accuracy and efficiency that have spread the practice of welding among manufacturers of chemical plant. The dependability of welded plant and structures is borne out by the fact of their acceptance by Government departments and by Lloyds.

The next paragraph elaborates on a statement that oxy-acetylene or oxy-hydrogen welding introduces impurities into the metal. From where do these impurities come? The combustion of oxygen and acetylene produces carbon dioxide and water-vapour. The purity of commercial oxygen is over 99 per cent., and the bulk of the impurities consists of the inert gas, argon: commercial Dissolved Acetylene has been used on occasion for anæsthetic purposes. Electric arc welding has not always been immune from gaseous and atmospheric contamination. This has been largely overcome by the use of shielded electrodes, which, in principle, surround the arc with a gaseous envelope. Why should one form of gaseous envelope contaminate the weld more than another? It can be demonstrated that the oxy-acetylene flame is neutral, and the fact is readily observed and controlled by the operator.

The alteration of the structure of the parent metal due to welding cannot be denied; it should be noted, however, that this only applies to worked metal. In the case of non-ferrous metals such as aluminium and copper, the weld metal can be dressed after welding so that the change in structure can hardly be detected microscopically. When such working cannot be carried out, the change in structure is much less likely to cause corrosion due to electrolytic action than is the presence of a riveted seam. It must not be overlooked that mechanical stresses due to riveting can induce failure under corrosive conditions. In a riveted joint it is unlikely that the compositions of the plates and the rivets are any more uniform than those of the parent metal and the weld metal in a properly welded seam; and the contact between the different compositions is much more abrupt, and includes crevices in which high concentrations of the electrolyte can collect. As regards the composition of the metal deposited, this is usually more uniform with the parent metal in oxy-acetylene than in arc welding.

Improved Steels

The problem of weld-decay is now a matter of history. Steel manufacturers have learnt how to combat carbide precipitation and consequent chromium impoverishment. The article in question goes on to state how this is done. Manufacturers of chemical plant are fully aware of the necessity for using these improved stainless steels, and the success of their methods is shown by the extent to which welding is employed for this material. The makers of stainless steel advocate welding as enabling the very best use to be made of the corrosion-resisting properties of their product.

In dealing with non-ferrous metals the article completely overlooked or ignored the use of the oxy-acetylene process, which, as a matter of undisputed fact, is far more widely used than any other process on non-ferrous work. The comparatively new atomic hydrogen process is given great prominence, but the statement that a flame free from oxygen is produced seems unnecessary unless it is inferred that other processes use a flame containing oxygen. It can only be repeated that, in the oxy-acetylene process, free oxygen never comes in contact with the weld metal unless by the express intention of the welder: the envelope of the flame is normally highly reducing, and use is made of the possibility of varying the flame conditions from high-reducing to highly-oxidising to produce some welds, free from impurities, in a range of metals, some of which no other process has been able to weld satisfactorily.

The foregoing remarks should have shown that there is already a long history of development behind both the electric arc and the oxy-acetylene welding processes. During this development it has become apparent that the differences inherent in the nature of both methods provide a basis on which an impartial welding engineer can fairly allocate a given job to one or the other process on technical and economic grounds.

There are many factors which may affect the choice besides the nature of the work: availability of plant and welders or monetary considerations often have the casting vote. But as the demands on welding have become more severe, so has it more and more been realised that a high degree of impartiality in selecting the best process for the job regardless of commercial propaganda or personal prejudice is essential for the advancement of welding generally, and for the stern commercial necessity of producing sound work at a competitive price. It is now by no means a matter of indifference to chemical engineering firms whether welding or rivetting is used: it is often a matter of success or bankruptcy.—Yours faithfully,

THE BRITISH OXYGEN CO., LTD.
C. COULSON-SMITH, M.Sc., F.I.C.
Chief of Chemical and Metallurgical Section.
London, N.W.2. October 4.

PERSONAL NOTES

CAPTAIN RICHARD LEGH has joined the board of the British Oxygen Co., Ltd.

* * * *

MR. DONALD MCDONALD has been appointed a director of Johnson, Matthey and Co., Ltd.

* * * *

MR. JOHN WILLIAMS, a delegate director of I.C.I. (General Chemicals) and manager of the Castner Kellner Works, Weston Point, has been invited to accept nomination for the mayoralty of Widnes.

* * * *

MR. SIMON DE VAULCHIER has been appointed head of the department of industrial design at Cooper Union, New York City. For six years Mr. de Vaulchier was director of design of the Colgate-Palmolive-Peet Company.

* * * *

MR. ATHELSTAN GRIFFITH SHEPHERD, LL.B., who is on the staff of Imperial Chemical Industries, Ltd., was married recently to Miss Marie Brockway. Mr. Shepherd was a pilot in the R.A.F. Reserve, and has now been called up for service.

* * * *

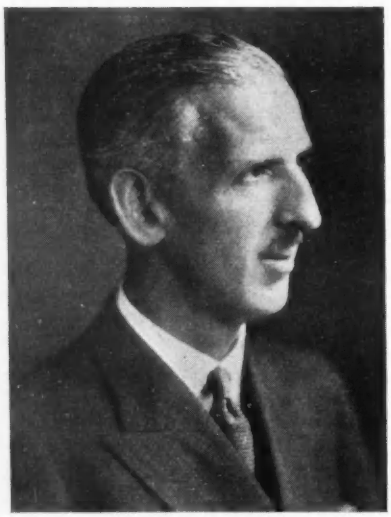
MR. JOHN CRAIG, C.B.E., D.L., chairman and managing director of Colvilles, Ltd., the Scottish steel combine, has been appointed chairman of Nimmo and Dunlop, Ltd., and James Nimmo and Co., Ltd., coalmasters, in succession to the late Sir Adam Nimmo, K.B.E. Mr. Craig is a member of the Council of the Federation of British Industries.

* * * *

DR. RONALD CUTHILL, an associate of the Institute of Chemistry and of the Textile Institute, has been appointed head of the chemistry department of the Bolton Technical College. A native of Bradford, Dr. Cuthill is particularly interested in chemical research and the application of chemistry to the textile industry. Immediately prior to his appointment at Bolton, he was head of the chemistry department at the Burnley Municipal College.

* * * *

SIR WILLIAM FRASER, C.B.E., deputy-chairman of the Anglo-Iranian Oil Co., Ltd., has been elected to fill the



Sir William Fraser.

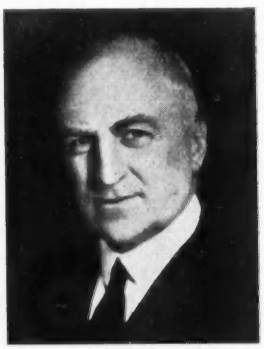
vacancy on the board of the Burmah Oil Company, Ltd., created by the recent death of Mr. D. W. Traill Cargill.

Sir William, who was educated at Glasgow Academy and the Royal Technical College, Glasgow, is also managing-director of Scottish Oils, Ltd., the Anglo-Iranian subsidiary which controls the Scottish shale oil industry.

MISS PEGGY SHAW, who is in business in Morecambe as a manufacturing chemist, was married last week to Mr. Francis Roland Hale, only son of Mr. and Mrs. Alfred Hale, of "Claremont," Green Gate, Bradford.

* * * *

LORD DUDLEY GORDON, chairman of J. and E. Hall, Ltd., has been appointed chairman of the war emergency committee of the Federaton of British Industries, and has accepted the position of deputy president of the Federation.



Sir George Beharrell.

SIR GEORGE BEHARRELL, chairman of the Dunlop Rubber Co., Ltd., and a director of International Latex Processes, Ltd., LORD GAINFORD, SIR GEORGE MACDONOGH, chairman of International Paint and Compositions Co., Ltd., and a director of Australian Paint and Compositions Co., Ltd., and International Paints (Canada), Ltd., and SIR FRANCIS JOSEPH, chairman of the Stafford Coal and Iron Co., Ltd., have been asked to serve as members of the committee.

MR. WILLIAM MACDOWALL, analytical chemist, of Pollokshields, Glasgow, left estate valued at £2,851.

OBITUARY

MR. JAMES HARVIE, former manager of the Calico Dye and Print Works, died recently at the age of 87. He had been associated with the works for a long period, and retired some years ago.

CHEMICAL INDUSTRY MEDAL

THE Chemical Industry Medal of the Society of Chemical Industry will be presented to Dr. Robert E. Wilson, President of the Pan American Petroleum and Transport Company, at a joint meeting of the American Section of the Society of Chemical Industry and the American Chemical Society on Nov. 10, at the Chemists' Club, New York City, with Dr. Wallace P. Cohoe presiding. The medal is awarded annually for valuable application of chemical research to industry and will be given this year to Dr. Wilson in recognition of his research studies on such varied subjects as flow of fluids, oiliness, corrosion, motor fuel volatility, clay and glue plasticity, and humidity, and in recognition of his industrial contributions in the use of tetraethyl lead, petroleum hydrocarbon cracking, and adoption of chemical engineering principles by the oil industry. Details as to speakers and subjects of addresses at the meeting will be announced later.

THE SUMER BANK, which is the organisation charged with the industrial development of Turkey, has decided to proceed with the construction, in the vicinity of Izmit, of the chlorine plant provided for in the Turkish Five-Year Plan, states a report from the office of the American Commercial Attaché, Istanbul. The construction of this plant, not including the installations, will cost 569,800 Turkish pounds.

General News——From Week to Week

IT WAS ANNOUNCED by the Admiralty last week that a limited number of laboratory assistants not over 25 years of age are required for the Royal Navy.

THE MAJORITY of the departments of the Imperial College of Science and Technology are remaining at South Kensington, but the mining department is being transferred to Camborne and the metallurgy department to Swansea.

CONSIDERABLE DAMAGE, amounting to several thousand pounds, was caused last week when fire broke out in Candleriggs Brewery, Alloa, belonging to George Younger & Son, Ltd., brewers. It originated in the Mill House and in a short time had attained considerable proportions.

A SERIES of slide films on various aspects of arc welding, welded fabrication, design, etc., have been prepared by the Lincoln Electric Company, Ltd., Welwyn Garden City, Herts. These films will be lent free of charge to technical schools who wish to use them for lecture purposes, or to engineering firms who wish to arrange similar lectures to their designers, draughtsmen, etc.

THE NEW EDITION (1939) of that invaluable handbook, *British Chemicals and Their Manufacture*, published by the Association of British Chemical Manufacturers has become available this week. The present edition is the "home issue" and differs from the overseas edition (which is to be issued later) by omitting the foreign index. As with previous editions, copies are available gratis, but only to genuine purchasers of chemicals and only on application, in writing, direct to the office of the Association, 166 Piccadilly, London, W.1.

AN AGREEMENT has been completed between the New Zealand Government and the Export Credits Guarantee Department regarding guarantees to United Kingdom exporters in connection with the export to New Zealand of goods wholly or partly of U.K. manufacture. The importer must make deposits in N.Z. to the full amount of the debt, and the department guarantees payment of 75 per cent. of each debt three months after the date of the deposit or on June 30, 1940, whichever is the later. At present applications should only be made for policies to cover shipments to be made before December 31, 1939. Particulars of premiums, etc., can be obtained from the office of the department, 9 Clement's Lane, London, E.C.4.

ACCORDING TO A MINISTRY OF INFORMATION statement it has been suggested to distributors of potash that until further notice they should restrict sales of potassic fertilisers to half the quantity supplied to each customer at the corresponding period last year. Manufacturers have been recommended to reduce the potash content of all compound fertilisers, so that, generally, the total quantity used does not exceed half what was used last season. It is pointed out that these recommendations are intended to lay down general lines of guidance, and that special cases will be dealt with on their merits.

Foreign News

THE CANADIAN GOVERNMENT have taken complete control over the export of all metals by the establishment of an export licence system.

THE CHEMICAL DIVISION of the American Bureau of Foreign and Domestic Commerce (Department of Commerce) states that exports of coal-tar colours, dyes, stains and colour lakes from the United States during the first six months of 1939 increased approximately seven per cent., to 5,082,343 pounds. This compares with 4,753,222 pounds during the corresponding period last year.

INVESTIGATION of the electrochemical behaviour of sulphamic acid by Piontelli and Ginbotto (*La Chimica e L'Industria*, August, 1939, 478-491) has revealed the utility of the acid and its salts in the electrodeposition and purification of many metals. It is particularly valuable in the electrodeposition of copper, iron, nickel, cobalt, cadmium and rhodium and in the refining of copper, silver, iron, nickel, cobalt and lead.

WE ARE INFORMED by the U.S. Department of Commerce that an item entitled "Sealing Platinum to Glass," which appeared on page 138 of THE CHEMICAL AGE of August 19, contained an error which previously appeared in their own publication, "The Technical News Bulletin of the National Bureau of Standards," in the July, 1939, issue. In lines 11 and 12 of the article in THE CHEMICAL AGE which read, "If the walls of the tube are thin as compared with its length . . .," the word "diameter" should appear instead of "length." The second sentence of the article should also be qualified to indicate that the statement refers to glasses of low thermal expansivity. Pyrex was the particular glass used in the Department's experimental work.

Emergency Addresses

The following are further emergency addresses:—

CARBIDE STORES, LTD., "Mapledean," Linkfield Lane, Redhill, Surrey.

WILFRED SMITH, LTD., 8 Bishops Avenue, London, N.2 (telephone: Tudor 5905).

C. TENNANT, SONS & CO., LTD., 66 Penylan Road, Cardiff (telephone: Cardiff 8620/3).

HONEYWILL AND STEIN LTD., The Distillers Co., Ltd., Great Burgh, Epsom, Surrey.

NOBEL CHEMICAL FINISHES, LTD., Wexham Road, Slough, Bucks (telephone: Slough 528).

CRODA, LTD., 78 Devonshire Way, Shirley, Croydon, Surrey (telephone: Springpark 4729).

HAROLD WILSON AND WITCO, LTD., 32 Welsby Court, Ealing, W.5 (telephone: Perivale 5958).

EXPLOSIVES AND CHEMICAL PRODUCTS, LTD., The Mount, Goring, Reading (telephone: Goring 199).

WILLIAM BLYTHE AND CO., LTD., 16 West Drive, Cheam, Sutton, Surrey (telephone: Vigilant 2024).

F. E. HOLLAND & CO., 42 Wharfdale Gardens, Thornton Heath, Surrey (telephone: Thornton Heath 1970).

THE BRITISH ANTI-FOULING COMPOSITION & PAINT CO., LTD., How Hatch, Chipstead, Surrey (telephone: Downland 444).

TECHNICAL PRODUCTS, LTD., 5 Lensbury Close, 238 Kingston Road, Teddington (telephone: Kingston 6871).

J. H. WISEMAN & CO., LTD., 100n Blackstock Road, Finsbury Park, London, N.4 (telephone: Canonbury 3081).

REX CAMPBELL & CO., LTD., Liskeard, Tupwood, Lane, Caterham Valley, Surrey (telephone: Caterham 2196).

FRANK SEGNER & CO., LTD., High Street West, Glossop, Derbyshire (telephone: Glossop 374; telegrams: Segner, Glossop).

R. W. GREEFF AND CO., LTD., The Retreat, Avenue Road, Hockerill Park, Bishops Stortford, Herts (telephone: Bishops Stortford 93).

BAKELITE, LTD., Brackley Lodge, Brackley, Northamptonshire (telephone: Brackley 144 and 145; telegrams: Bakelite, Brackley, Northants).

BRITISH INDUSTRIAL SOLVENTS, LTD., all business at The Distillers Co., Ltd., Great Burgh, Epsom, Surrey (telephone: Burgh Heath 741/3 and 3470/3).

MONSANTO CHEMICALS, LTD., Ruabon, Wrexham, Denbighshire (telephone: Ruabon 3). Sales staff, Whitemeads, Hatch End (telephone: Hatch End 83).

The emergency address of the SOCIETY OF ENGINEERS is: c/o B. B. Tarring, O.B.E., F.S.E., hon. sec., The Society of Engineers (Incorporated), 56 Church Street, Weybridge, Surrey (telephone: Weybridge 376).

Weekly Prices of British Chemical Products

THE demand for general chemicals this week has been of substantial dimensions and in many cases supplies are for the moment inadequate to meet the rush of buying orders. These difficulties, however, are regarded as temporary and it is anticipated that more settled conditions will prevail when consumers immediate requirements have been satisfied. Price conditions generally are in a state of adjustment and nominal quotations only are available for many chemical materials. Controlled maximum prices have been announced for acetic acid and acetone and values for these products remain unchanged at the pre-war level. In the coal tar products buying has been on a fairly large scale and cresylic acid, carbolic acid and pitch are very firm in quotation. Formaldehyde also was in brisk demand.

MANCHESTER.—Trading in the alkalis and a number of other leading products on the Manchester chemical market during the past week has been on a moderate scale, whilst there is a continued active call for supplies against old contracts. Business in numerous imported materials, however, is extremely difficult and spot offers are far from plentiful, particularly in the potash group. It is probable that the position in this respect will be no easier for some time owing to the uncertainty of shipments from sources of supply available. The tar products generally are on a firm basis and in several sections a further upward movement has to be recorded.

GLASGOW.—The Scottish heavy chemical market continues to show considerable activity although dealing is restricted and prices are quoted on a day to day basis.

Price Changes*

The state of the market for general chemicals, and the practical impossibility for the moment of obtaining supplies of certain commodities, has caused the market price for such commodities to be merely nominal. In these cases the last ascertainable prices have been included in the list below and the commodities concerned have been marked with an asterisk. Our market representatives are making every effort to obtain prices, and as soon as these are known they will be included.

General Chemicals

ACETIC ACID.—Maximum prices per ton: 40% technical, 1 ton or over, £15 12s.; 10 cwt. and less than 1 ton, £16 12s.; 4 cwt. and less than 10 cwt., £17 12s.; 80% technical, 1 ton, £29 5s.; 10 cwt./1 ton, £30 5s.; 4/10 cwt., £31 5s.; 80% pure, 1 ton, £31 5s.; 10 cwt./1 ton, £32 5s.; 4/10 cwt., £33 5s.; commermercial glacial, 1 ton, £37; 10 cwt./1 ton £38; 4/10 cwt., £29; delivered buyers' premises in returnable barrels.

ACETONE.—Maximum prices per ton, 50 tons and over, £39; 10/50 tons, £39 10s.; 5/10 tons, £40; 1/5 tons, £40 10s.; single drums, £41 10s., delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each; delivered in containers of less than 45 gallons but not less than 10 gallons £10 10s. per ton in excess of maximum prices; delivered in containers less than 10 gallons each £10 10s. per ton in excess of maximum prices, plus a reasonable allowance.

*ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, **£10 7s. 6d. per ton; lump, £9 17s. 6d.**

*ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs.

AMMONIA, ANHYDROUS.—99.95%, 1s. to 2s. per lb. according to quantity in loaned cylinders, carriage paid; less for important contracts.

*AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising £21 per ton, in casks, ex wharf. See also Salammoniac.

*AMMONIUM DICHROMATE.—9½d. per lb. d/d U.K.

*ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Prices nominal, f.o.b. Antwerp, subject to works acceptance.

*BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex **store. GLASGOW: £12 per ton.**

*BLEACHING POWDER.—Spot, 35/37%, £9 5s. per ton in casks, **special terms for contract. GLASGOW: £9 5s. per ton net ex store.**

BORAX COMMERCIAL.—Granulated, £18 per ton; crystal, £19; powdered, £19 10s.; extra finely powdered, £20 10s; B.P. crystals, £27; powdered, £27 10s.; extra fine, £28 10s. per ton, in free 1-cwt. bags, carriage paid in Great Britain. Borax Glass, lump, £60; powder, £61; in tin-lined cases for home trade only, packages free, carriage paid in Great Britain.

BORIC ACID.—Commercial granulated, £32 per ton; crystal, £33; powdered, £34; extra finely powdered, £36; large flakes, £44 10s.; B.P. crystals, £41; powdered, £42; extra fine powdered, £44 per ton for ton lots, in free 1-cwt. bags, carriage paid in Great Britain.

*CALCIUM BISULPHITE.—£6 15s. per ton f.o.r. London.

*CALCIUM CHLORIDE.—GLASGOW: 70/75% solid, £5 12s. 6d. per **ton ex store.**

*CHARCOAL LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, **£7 to £9 per ton according to grade and locality.**

*CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4½d. per lb. d/d station in single 70-lb. cylinders.

*CHROMETAN.—Crystals, 3d. per lb.; liquor, £13 per ton d/d **station in drums.**

*CHROMIC ACID.—10d. per lb., less 2½%; d/d U.K.

*CHROMIC OXIDE.—11½d. per lb.; d/d U.K.

*CITRIC ACID.— 1s. 0½d. per lb. MANCHESTER: 1s. 0½d. GLASGOW: **B.P. crystals, 1s. 0½d. per lb; less 5%, ex store.**

*COPPER SULPHATE.—£18 5s per ton, less 2% in bags. MANCHESTER: £23 per ton f.o.b. GLASGOW: £19 10s. **per ton, less 5%, Liverpool in casks.**

*CREAM OF TARTAR.—100%, £4 12s. per cwt., less 2½%. GLASGOW: **99%, £4 12s. per cwt. in 5-cwt. casks.**

FORMALDEHYDE.—40% by volume, £25 to £27 per ton, according to quantity, in casks, ex store.

FORMIC ACID.—85%, £42 per ton for ton lots, ex store, in cylinders; smaller parcels quoted at 45s. 6d. to 47s. 6d. per cwt., ex store.

*GLYCERINE.—Chemically pure, double distilled, 1,260 s.g., in tins, **£3 10s. to £4 10s. per cwt. according to quantity; in drums, £3 2s. 6d. to £3 16s. 0d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.**

HEXAMINE.—Technical grade for commercial purposes, 1s. 4d. per lb.; free-running crystals are quoted at 1s. 7d. per lb.; carriage paid for bulk lots.

*HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according **to purity, strength and locality.**

*IODINE.—Resublimed B.P., 7s. 9d. per lb. in 7 lb. lots.

*LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by **vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One ton lots ex works, barrels free.**

*LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. MANCHESTER: White, £38. GLASGOW: White crystals, £30; brown, £1 per ton less.

LEAD NITRATE.—About £40 per ton in casks.

LEAD, RED.—English, 5/10 cwt., £35; 10 cwt. to 1 ton, £34 15s.; 1/2 tons, £34 10s.; 2/5 tons, £34; 5/20 tons, £33 10s.; 20/100 tons, £33; over 100 tons, £32 10s. per ton, less 2½ per cent. carriage paid; non-setting red lead, 10s. per ton dearer in each case; Continental material, £1 per ton cheaper.

LEAD, WHITE.—Dry English, less than 5 tons, £45; 5/15 tons, £41; 15/25 tons, £40 10s.; 25/50 tons, £40; 50/200 tons, £39 10s. per ton, less 5% carriage paid; Continental material £1 per ton cheaper. Ground in oil, English, 1/5 cwt., £53; 5/10 cwt., £52; 10 cwt. to 1 ton, £51 10s.; 1/2 tons, £50; 2/5 tons, £49; 5/10 tons, £47; 10/15 tons, £46; 15/25 tons, £45 10s.; 25/50 tons, £45; 50/100 tons, £44 10s. per ton, less 5% carriage paid. Continental material £2 per ton **cheaper.**

*LITHARGE.—GLASGOW: Ground, £31 per ton, less 2½%, carriage **paid for 2-ton lots.**

LITHOPONE.—Maximum prices, 28/30 per cent., £15 10s. per ton, 60 per cent., £29 per ton, delivered, buyers' premises.

*MAGNESITE.—Calcined, in bags, ex works, about £8 per ton.

*MAGNESIUM CHLORIDE.—Solid (ex wharf), £5 10s. per ton. **GLASGOW: £7 5s. per ton.**

*MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

*MERCURY PRODUCTS.—Ammoniated B.P. (white precip), lump, **6s. 5d. per lb.; powder B.P., 6s. 7d.; bichloride B.P. (corros. sub.), 5s. 8d.; powder B.P., 5s. 1d.; chloride B.P. (calomel), 6s. 2d.; red oxide cryst. (red precip.), 7s. 6d.; levig, 6s. 9d.; yellow oxide B.P. 6s. 10d.; persulphate white B.P.C., 6s. 7d.; sulphide black (hvd. sulph. cum. sulph. 50%), 6s. 6d. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.**

*METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; **pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities.**

*NITRIC ACID.—Spot, £25 to £30 per ton, according to strength, **quantity and destination.**

OXALIC ACID.—£48 5s. per ton for ton lots, ex wharf, in casks, smaller parcels, 53s. to 57s. per cwt., ex store; deliveries slow.

*PARAFFIN WAX.—GLASGOW: 3¾d per lb.

*POTASH, CAUSTIC.—Solid, £33 5s. to £38 per ton according to quantity, ex store; broken, £40 per ton. MANCHESTER: £47.

POTASSIUM CHLORATE.—Imported powder and crystals, ex store London, 10d. to 1s. per lb.

*POTASSIUM DICHROMATE.—5¼d. per lb. carriage paid. GLASGOW: 5¼d. per lb., net, carriage paid.

*POTASSIUM CHROMATE.—9d. per lb. d/d U.K.

*POTASSIUM IODIDE.—B.P. 7s. per lb. in 7 lb. lots.

*POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity.

POTASSIUM PERMANGANATE.—Commercial, about 10¾d. per lb., delivered.

POTASSIUM PRUSSIATE.—Yellow, market nominal, supplies scarce. MANCHESTER: Yellow, 8¾d. to 9¼d. per lb.

SALAMMONIAC.—Dog-tooth crystals, £40 per ton; medium, £39; fine white crystals, £20; in casks, ex store.

*SALT CAKE.—Unground, spot, £3 8s. 6d. per ton.

*SODA ASH.—Light 98/100%, £5 17s. 6d. per ton f.o.r. in bags.

*SODA, CAUSTIC.—Solid, 76/77° spot, £13 10s. per ton d/d station.

*SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£25 to £26 per ton, ex wharf.

SODIUM BICARBONATE.—About £10 10s. per ton, in bags.

*SODIUM BISULPHITE POWDER.—60/62%, £12 10s. to £14 per ton d/d in 2-ton lots for home trade.

*SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.

SODIUM CHLORATE.—£27 10s. to £32 per ton, d/d according to quantity.

*SODIUM DICHROMATE.—Crystals cake and powder 4¼d. per lb. net d/d U.K. with rebates for contracts. GLASGOW: 4¼d. per lb., carriage paid.

*SODIUM CHROMATE.—5d. per lb. d/d U.K.

*SODIUM HYPOSULPHITE.—Pea crystals, £15 15s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.

*SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.

*SODIUM NITRATE.—Refined, £8 5s. per ton for 6-ton lots d/d GLASGOW: £1 12s. per cwt. in 1-cwt. kegs, net, ex store.

*SODIUM NITRITE.—£18 5s. per ton for ton lots.

*SODIUM PERBORATE.—10%, £4 per cwt. d/d in 1-cwt. drums.

*SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £16 10s. per ton delivered per ton lots.

*SODIUM PRUSSIATE.—4d. per lb. for ton lots. MANCHESTER: 4¼d. to 5d. GLASGOW: 4d.

*SODIUM SILICATE.—£8 2s. 6d. per ton.

*SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.

*SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. MANCHESTER: £3 15s.

*SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.

*SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.

*SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

*SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.

*TARTARIC ACID.—1s. 1¼d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1¼d. per lb. GLASGOW: 1s. 1¼d. per lb., 5%, ex store.

ZINC OXIDE.—Maximum prices: White seal, £23 10s. per ton; red seal, £19 10s.; green seal, £22 10s. d/d buyers' premises.

*ZINC SULPHATE.—Tech., £11 10s. f.o.r., in 2-cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7¾d. to 1s. 3d. per lb., according to quality. Crimson, 1s. 7½d. to 1s. 8¼d. per lb.

ARSENIC SULPHIDE.—Yellow, 1s. 6d. to 1s. 8d. per lb.

CARBON DISULPHIDE.—£33 to £36 per ton, according to quantity, drums extra.

CARBON TETRACHLORIDE.—£44 to £49 per ton, according to quantity, drums extra.

CHROMIUM OXIDE.—Green, 1s. 3d. per lb.

INDIA-RUBBER SUBSTITUTES.—White, 4¼d. to 5d. per lb.; dark 3¾d. to 4¾d. per lb.

SULPHUR CHLORIDE.—6d. to 8d. per lb., according to quantity.

VEGETABLE BLACK.—£35 per ton upwards; 28/30%, £15 10s. 0d.; 60%, £29, delivered buyers' premises.

ZINC SULPHIDE.—£56 per ton ex works.

Plus 5% War Charge.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1940; September, £7 5s.; October, £7 6s. 6d.; November, £7 8s.; December, £7 9s. 6d.; January, 1940; £7 11s., February £7 12s. 6d.; March/June, £7 14s.

CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1940; September £8 2s. 6d.; October £8 3s. 9d.; November £8 5s.; December, £8 6s. 3d.; January, 1940, £8 7s. 6d.; February £8 8s. 9d.; March £8 10s.; April/June, £8 11s. 3d.

NITRO-CHALK.—£7 10s. 6d. per ton up to June 30, 1940.

SODIUM NITRATE.—£8 5s. per ton for delivery up to June 30, 1940.

CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.

AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4½d. to 1s. 5d., pure 1s. 8½d. to 1s. 9. MANCHESTER: Crude, 1s. 0½d. to 1s. 0½d. per gal.; pure, 1s. 8d. to 1s. 8½d. per gal.; motor grade 1s. 6½d.

CARBOLIC ACID.—Crystals, 9d. per lb.; Crude, 60's, 3s. to 3s. 3d., according to specification; Pale, 99/100%, per lb. f.o.b. in drums; crude, 2s. 9d. to 3s per gal. American duty free, 2s. 9d. to 3s. f.o.b.

CREOSOTE.—Home trade, 3¾d. to 4d. per gal., f.o.r., makers' works; exports 6d. to 6¼d. per gal., according to grade. MANCHESTER: 3¾d. to 5d.

CRESYLIC ACID.—98/100%, 2s. 9d. to 3s. per gal., according to specification. MANCHESTER: Pale, 99/100%, 2s. 8d.

NAPHTHA.—Solvent, 90/160, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1½d. to 1s. 3d. per gal., naked at works, according to quantity. MANCHESTER: 90/160%, 1s. 6d. to 1s. 7½d. per gal.

NAPHTHALENE.—Crude, whizzed or hot pressed, £6 to £6 10s. per ton; purified crystals, £9 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £4 10s. per ton. MANCHESTER: Refined, £17.

PITCH.—Medium, soft, 35s. per ton, f.o.b. MANCHESTER: 27s. 6d. f.o.b. East Coast.

PYRIDINE.—90/140%, 17s. 6d. per gal.; 90/160%, 15s.; 90/180%, 3s. to 4s. per gal. f.o.b. MANCHESTER: 13s. to 17s. per gallon.

TOLUOL.—90%, 2s. 1d. to 2s. 2d. per gal.; pure 2s. 6d. to 2s. 7d. MANCHESTER: Pure, 2s. 7d. per gallon, naked.

XYLOL.—Commercial, 2s. 3d. per gal.; pure, 2s. 5d. MANCHESTER: 2s. 6d. per gallon.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £6 15s. to £9 5s. per ton; grey, £8 to £8 5s. MANCHESTER: Grey, £14.

METHYL ACETONE.—40.50%, £32 to £35 per ton.

WOOD CREOSOTE.—Unrefined, 6d. to 8d. per gal., according to boiling range.

WOOD NAPHTHA, MISCIBLE.— 2s. 8d. to 3s. per gal;. solvent, 3s. to 3s. 5d. per gal.

WOOD TAR.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZALDEHYDE.—1s. 10d. per lb., for cwt. lots, net packages.

BENZIDINE, HCl.—2s. 7½d. per lb., 100% as base, in casks.

BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 11d. per lb. d/d buyer's works.

m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.

o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.

p-CRESOL 34/35° C.— 1s. 7d. to 1s. 8d. per lb. in ton lots.

DICHLORANILINE.—2s. 1½d. to 2s 5½d. per lb.

DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.

DINITROBENZENE.—7½d. per lb.

DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.

DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 11d.

DIPHENYLAMINE.—Spot, 2s. 3d. per lb.; d/d buyer's works.

GAMMA ACID, Spot, 4s. 4½d. per lb. 100%, d/d buyer's works.

H ACID.—Spot, 2s. 7d. per lb.; 100%, d/d buyer's works.

NAPHTHIONIC ACID.—1s. 10d. per lb.

β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.

α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.

β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.

NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.

o-NITRANILINE.—4s. 3½d. per lb.

m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 10d. to 1s. 11d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.

NITRONAPHTHALENE.—9½d. per lb.; P.G., 1s. 0½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.

SULPHANILIC ACID.—Spot, 8½d. per lb. 100%, d/d buyer's works.

o-TOLUIDINE.—10½d. per lb., in 8/10 cwt. drums, drums extra.

p-TOLUIDINE.—1s. 10½d. per lb., in casks.

m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Latest Oil Prices

LONDON.—October 5.—Arrangements for control are not yet completed, and, apart from non-controlled commodities, trading was very restricted.

CLASSIFIED SECTION

NOTE: Trade announcements, other than strictly second-hand and job lines, cannot be inserted in these pages except by firms whose advertisements run in the display columns

EDUCATIONAL

(2d. per word ; minimum 18 words ; 3 or more insertions, 1½d. per word per insertion. Sixpence extra is charged when replies are addressed to box Numbers.)

AUTHORITATIVE TRAINING IN WARTIME.

STUDY at HOME with the T.I.G.B.—free from blackout and travel difficulties.

ENROL with The T.I.G.B. for the A.M.I.Chem.E. Examination in which Students of The T.I.G.B. have gained FIRST PLACE IN LAST TWO SUCCESSIVE YEARS.

Write to-day for "The Engineers Guide to Success"—Free—containing the world's widest choice of Engineering Courses—over 200—the Department of Chemical Technology including Chemical Engineering Processes, Plant Construction, Works Design and Operation and Organisation and Management—and which alone gives the Regulations for A.M.I.Chem.E., A.M.I.Mech.E., A.M.I.E.E., C.G., B.Sc., etc. The T.I.G.B. guarantees training until successful.

THE TECHNOLOGICAL INSTITUTE OF GREAT BRITAIN,
219 Temple Bar House, Fleet Street, E.C.4.
(Founded 1917 20,000 Successes)

FOR SALE

(2d. per word ; minimum 18 words ; 3 or more insertions, 1½d. per word per insertion. Sixpence extra is charged when replies are addressed to box Numbers.)

"600"

VERTICAL COPPER STILL ; 4 ft. 8 in. dia. by 6 ft. 9 in. deep ; dished bottom and top ; fitted wih copper steam coil and transverse copper heating coil ; bronze agitator fitted to still body.

VERTICAL CAST IRON VEGETABLE STEAMER ; fitted with three compartments, each with two trays and hinged door, overall dimensions 5 ft. 10½ in. by 2 ft. 6 in. by 2 ft. 8 in.

SIZE No. 16 ATRITOR, by ALFRED HERBERT, LTD., capacity approx. 4,000 lbs. per hour, 40 H.P. required to drive 1,250 r.p.m.

THREE GAS-FIRED ROTARY DRYERS, by THYSEN ; manufactured 1935 ; 5 ft. 0 in. dia. by 50 ft. 0 in. long by 1.1/16 in. thick ; gas firing by 15 burners (by Brayshaw, Manchester) carried in steel sides, complete with piping, valves, also reduction gear and gas condenser.

WELDED STEEL MIXING PAN, 4 ft. 6 in. by 5 ft. 0 in. deep, overdriven agitator with 4 cast iron paddles, wrought iron external steam heating coil 1 in. dia. ; planished steel casing, steel covers, cocks and valves.

GEORGE COHEN, SONS & CO., LTD.,
STANNINGLEY, LEEDS.

'Phone 98 Staines.

MONEL Metal Jacketed Tipping Pan by Morton, 40 gallons ; Rotary Screen, 6 ft. long by 3 ft. dia. ; Jacketed Vacuum Oven, 5 ft. by 5 ft. by 6 ft. ; Werner Z Blade Mixer, 30 in. by 30 in. by 24 in. ; Filter Press, 32 Plates, 26 in. dia.

HARRY H. GARDAM AND CO., LTD., STAINES.

VATS RANGING BETWEEN 200/15,000 gallons for sale ; also 4-gln JARS. MEACHAM DOUGLAS & CO., Bristol, 3. TN. 63501.

RICHARD SIZER, LIMITED, OFFER THE FOLLOWING :—

Raymond 6-Roller GRINDING MILL, under-driven, complete with its cover and fan, suitable for pulverised coal fuel.

Copper built AUTOCLAVE, 20 ft. long by 4 ft. diameter, about ¾ in. plate, rivetted together, 130 lb. working pressure.

Three steam jacketted ROTARY DRYERS OR MIXERS, 14 ft. long, 4 ft. diameter, mounted on ball bearings and each of 1,000 gallons capacity.

Horizontal belt-driven VACUUM PUMP, about 12 in. by 12 in., by Pearn.

Horizontal CONVEYOR, 275 ft. long, 30 in. wide, electrically driven, for bags, sacks, or similar material.

One steam jacketted Melvin ; one steam jacketted Mason, and 12 other various MIXERS.

Six Gardner and Hind & Lund Steam Jacketted "U" shape RAPID DRYERS, 6 ft., 5 ft., and 3 ft. 6 in. long, belt and gear driven, and with bottom outlets.

Excellent STORAGE TANK, 10 ft. by 8 ft. by 5 ft. deep, steel built.

One excellent C.I. SECTIONAL TANK, 10 ft. by 10 ft. by 10 ft., built in 20 plates.

Two excellent Cylindrical STORAGE VESSELS, 30 ft. long by 10 ft. 6 in. diameter, of ⅜ in. plate, complete with mountings, depth gauges, and cleaning out doors 16 in. square.

LIST 739 JUST AVAILABLE : COPY SENT UPON APPLICATION.

RICHARD SIZER, LIMITED, CUBER WORKS, HULL.
Telephone : 31743 (3 lines). Telegrams : "Sizer, Hull."